Claims

[c1] A device for producing a microfluid jet in a fluid environment, said device comprising:
a microfluid chamber having:
(i)at least one opening at a distal end;
(ii)a vapor producing means opposite said opening;
wherein said fluid chamber is capable of producing a microfluidic jet in a fluid environment upon actuation.

[c2] The device according to Claim 1, wherein said vapor producing means produces a vapor bubble inside said microfluid chamber.

[c3] The device according to Claim 1, wherein said vapor producing means is a high pressure vapor producing means.

[c4] The device according to Claim 3, wherein said high pressure vapor producing means is an electrode.

[c5] The device according to Claim 3, wherein said high pressure vapor producing means is a laser.

[c6] The device according to Claim 1, wherein said opening has a diameter ranging from about 1 μ m to 1 mm.

[c7] The device according to Claim 1, wherein a distance of 1 μ m to 1 cm separates said opening and said oppositely positioned vapor producing means.

[c8] A device for producing a microfluidic jet in a fluid environment, said device comprising:
a micronozzel having a distal end comprising a fluid chamber, wherein said fluid chamber has a volume ranging from about 10 μm^3 to 1 cm^3 and comprises:
(i)a single opening having a diameter ranging from about 1 μ m to 1 mm; and
(ii)a vapor producing means located opposite said opening and separated from said opening by a distance ranging from about 1 μ m to 1 cm;
wherein said fluid chamber is capable of producing a microfluidic jet in a fluid

environment upon actuation.

[c9] The device according to Claim 8, wherein said vapor producing means is a high pressure vapor producing means capable of introducing energy into a fluid in a manner sufficient to produce a vapor bubble.

[c10] The device according to Claim 9, wherein said high pressure vapor producing means comprises an electrode.

[c11] The device according to Claim 9, wherein said vapor producing means comprises a laser.

[c12] The device according to Claim 8, wherein said opening has a diameter ranging from about 1 μ m to 1 mm.

[c13] A device for producing a microfluidic jet in a fluid environment, said device comprising:
a micronozzel having a distal end comprising a fluid chamber, wherein said fluid chamber has a volume ranging from about 10 μm^3 to 1 cm^3 and comprises:
(i)a single opening having a diameter ranging from about 1 μ m to 1 mm; and
(ii)an electrode vapor producing means located opposite said opening and separated from said opening by a distance ranging from about 10 μ m to 1 cm;
wherein said fluid chamber is capable of producing a microfluidic jet in a fluid environment upon actuation.

[c14] A device comprising at least two microfluid chambers, wherein each microfluid chamber comprises:
(i)an opening at a distal end; and
(ii)a vapor producing means opposite said opening;
wherein each of said microfluid chambers is capable of producing a microfluidic jet in a fluid environment upon actuation.

[c15] The device according to Claim 14, wherein said at least two microfluid chambers are individually actuatable.

[c16] The device according to Claim 14, wherein said device comprises a plurality of

said microfluid chambers.

[c17] The device according to Claim 16, wherein said device comprises an array of microfluid chambers.

[c18] A method of producing a fluid microjet in a fluid environment, said method comprising:
(a)contacting said fluid environment with a microfluid chamber comprising:
(i)an opening at a distal end; and
(ii)a vapor producing means opposite said openings;; and
(b)actuating said vapor producing means in a manner sufficient to produce a vapor bubble inside said fluid chamber;
whereby a fluid microjet is produced in said fluid environment.

[c19] The method according to Claim 18, wherein said vapor producing means is actuated in a manner sufficient to produce pulsed microfluid jets in said fluid environment.

[c20] The method according to Claim 18, wherein said microfluid chamber is positioned proximal to a tissue in said fluid environment and said method is a method of physically modulating said tissue with said fluid microjet.

[c21] The method according to Claim 20, wherein said method is a method of cutting tissue.

[c22] The method according to Claim 20, wherein said micronozzel is positioned proximal to a cell and said method is a method of introducing fluid into said cell.

[c23] The method according to Claim 20, wherein said micronozzel is positioned proximal to a blood vessel and said method is a method of manipulating a clot by a water jet.